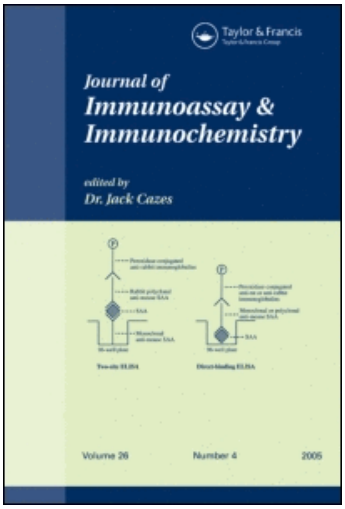

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The Book Corner

Preparative Layer Chromatography, Edited by Teresa Kowalska and Joseph Sherma, CRC Taylor & Francis, Boca Raton, FL, 2006, 424 pages. Price: $169.95

Preparative Layer Chromatography explains how the method is used for separating large quantities of mixtures containing a wide variety of compounds. It offers a broad review of preparative layer chromatography (PLC) applications and working procedures for microseparations involving organic, inorganic, and organometallic compounds.

The book contains theoretical background, chemical principles, and relevance of PLC to a wide range of applications, particularly in the study of pharmaceuticals and biochemistry. The contributors to the book are experts on the topics about which they write and include many of the best known and most knowledgeable workers in the field of thin-layer chromatography and PLC throughout the world. Rather than attempting to adopt a uniform style, they have allowed chapter authors the freedom to present their topics in a way that they consider most effective. They have used figures and tables as needed to augment the test, and selective reference lists include the most important new literature, as well as significant older references, to set the basis of their chapters.

This book has been designed as a practical, comprehensive source of information on the field of classical preparative layer chromatography (PLC). It is organized in two parts, the first of which covers the theory and up-to-date procedures of PLC (Chapters 1 through 8), while the second (Chapters 9 through 16) includes applications to a selection of the most important compound classes and samples types. Overall, the topics covered in the 16 chapters are evidence for the versatility and wide use of PLC at the current time. Chapter 1 is an introductory chapter. Chapter 2 provides information on efforts undertaken to date to establish the theoretical foundations of PLC. With growing availability and popularity of modern computer-aided densitometers, separation results can be obtained in digital form as a series of concentration profiles that can be relatively easily assessed and processed. From these, relevant conclusions can be drawn, in exactly the same manner as in automated column chromatographic techniques. Efforts undertaken to build a theoretical

foundation of PLC largely consist of adaptation of known strategies (with their validity confirmed in preparative column liquid chromatography) to the working conditions of PLC systems.

Chapters 3 through Chapter 8 deal with the basic aspects of the practical uses of PLC. Chapter 3 describes sorbent materials and precoated layers for normal or straight phase (adsorption) chromatography (silica gel and aluminum oxide 60) and partition chromatography (silica gel, aluminum oxide 150, and cellulose), and precoated layers for reversed-phase chromatography (RP-18 or C-18). Properties of the bulk sorbents and precoated layers, a survey of commercial products, and examples of substance classes that can be separated are given.

Chapter 4 discusses the selection and optimization of mobile phases for successful separations in PLC. Chapter 5 details procedures for sample application and development of layers, and Chapter 6 complements Chapter 5 by dealing specifically with the use of horizontal chambers for the development of preparative layers, including linear, continuous, two-dimensional, gradient, circular, and anti-circular modes.

In Chapter 7, approaches for visualization of zones in chromatograms are discussed, including use of nondestructive and destructive dyeing reagents, fluorescence quenching on layers with a fluorescent indicator, and densitometry. In Chapter 8, additional detection methods, such as those used for biologically active and radioactive zones, as well as the recovery of separated, detected zones by scraping and elution techniques are covered.

Section II of the book, encompassing Chapters 9 through 16, presents practical applications of PLC in the chemical, biochemical, and life science fields. The great variety of these applications illustrates well the versatility and excellent performance of PLC in solving a wide spectrum of micropreparative problems.

Chapter 9 shows the importance of PLC in the critical field of medical research, with representative examples of the applications to amino acids, carbohydrates, lipids, and pharmacokinetic studies.

Chapter 10 is devoted to the preparation and purification of hydrophilic vitamins (C, B_1, B_2, B_6, B_{12}, nicotinic acid and nicotinamide, pantothenic acid, biotin, and folic acid) in pharmaceutical preparations, food products, and biological samples.

PLC of plant extracts is presented in Chapter 11, with sections on the choice of systems, sampling, choice of the sample solvent, detection, and development modes. These applications in the field of pharmacognosy play a key role in the investigation and understanding of the healing potential of the constituents of medicinal plants.

PLC of lipids is discussed in Chapter 12. Lipids play a vital role in virtually all aspects of human and animal life. Many studies of food quality, human health, metabolic and ageing processes, pheromone activity in animals, etc., benefit greatly from the use of PLC for the separation and isolation of lipids.

Chapter 13 is devoted to the PLC of natural pigments, which encompass flavonoids, anthocyanins, carotenoids, chlorophylls and chlorophyll derivatives,

porphyrins, quinines, and betalains. Chromatography of pigments is especially difficult because many are photo- and air-sensitive and can degrade rapidly unless precautions are taken.

In Chapter 14, one of the least-used applications of TLC and PLC is described, namely inorganics and organometallics. These separations in the analytical mode often require quite unusual stationary phases (e.g., inorganic ion exchangers and impregnated and mixed layers) combined with a variety of diverse mobile phases. This means that the use of the analogous systems in the preparative mode represents an unusually difficult challenge.

Chapter 15 allows a fairly broad insight into the areas of experimental geochemistry that can benefit from PLC. Owing to the considerable complexity of geochemical samples having an organic origin, PLC plays the role of a pilot separation technique, enabling primary group fractionation of the respective natural mixtures, followed by secondary fractionation of these groups with the aid of automated column techniques and, finally, followed by identification of the individual separated species. Examples related to oils, bitumens, coal liquids, and pyrolysates are given.

The final chapter (Chapter 16) shows how PLC can be used to isolate and identify unknown terpenoid compounds from the frankincense resin (olibanum) and to find marker diterpenes. The novel development at low temperatures is included in the PLC methods described here.

The book is a valuable resource for practitioners and teachers in diverse scientific fields that make use of chromatographic methods.

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Section II

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